

Claims

1. A process for producing resin-impregnated mats from fibre-reinforced plastics, sheet-moulding compounds (SMCs), for use as semi-finished products in the production of components by the extrusion process, characterised in that the non-woven-fabric reinforcement of the resin-impregnated mats is formed from at least one layer of intersecting fibres which resembles a textile structure, the alignment of these fibres, the fibre orientation, being matched to the loading by the forces acting on the component.
2. Process according to Claim 1, characterised in that the non-woven-fabric reinforcement is additionally built up from layers of fibres having a different alignment.
3. Process according to Claim 1 or 2, characterised in that at least one layer of unidirectionally aligned fibres is introduced into the non-woven-fabric reinforcement of the resin-impregnated mat.
4. Process according to one of Claims 1 to 3, characterised in that the fibres of the textile structure and, where appropriate, the other fibres of the non-woven fabric are aligned in relation to the effective direction of individual forces.
5. Process according to one of Claims 1 to 4, characterised in that the fibres of the textile structure and, where appropriate, the other fibres of the non-woven fabric are joined to one another at their points of intersection.
6. Process according to one of Claims 1 to 5, characterised in that the fibres of the textile structure in the non-woven-fabric reinforcement are laid onto one another at an angle of intersection that

corresponds to the angles of intersection of conventional textile structures.

- 5 7. Process according to one of Claims 1 to 6, characterised in that in the case of a thrust loading of the component the fibres of the textile structure are laid at an angle of intersection of 45 degrees.
- 10 8. Process according to one of Claims 1 to 7, characterised in that the resin-impregnated mat is built up from several layers of a non-woven-fabric reinforcement which each exhibit a textile structure.
- 15 9. Process according to Claim 8, characterised in that in the individual layers the angles of intersection of the fibres of the textile structures are chosen to be different.
- 15 10. Process according to one of Claims 1 to 9, characterised in that in addition at least one layer of random fibres is introduced into the resin-impregnated mat.
- 20 11. Process according to one of Claims 1 to 10, characterised in that the fibres are produced from glass, carbon, aramide or HD polyethylene.
12. Process according to one of Claims 1 to 11, characterised in that the fibres in the resin-impregnated mat are prepared for a flow.
- 25 13. A resin-impregnated mat produced by the process according to one of Claims 1 to 12, characterised in that the non-woven-fabric reinforcement (2) of the resin-impregnated mat (26) comprises at least one layer (4) of intersecting fibres (4o, 4u) which
30 resembles a textile structure, the alignment of these fibres (4o, 4u), the fibre orientation, being matched to the loading by the forces acting on the component.

14. Resin-impregnated mat according to Claim 13, characterised in that the non-woven-fabric reinforcement (2) is additionally built up from layers of fibres (5, 6) having a different alignment.
- 5 15. Resin-impregnated mat according to Claim 13 or 14, characterised in that at least one layer of unidirectionally aligned fibres (5, 6) has been introduced into the non-woven-fabric reinforcement (2) of the resin-impregnated mat (26).
- 10 16. Resin-impregnated mat according to one of Claims 13 to 15, characterised in that the fibres (4o, 4u) in the textile structure (4) and, where appropriate, the other fibres in the non-woven fabric (2) are aligned in
15 relation to the effective direction of individual forces.
17. Resin-impregnated mat according to one of Claims 13 to 16, characterised in that the fibres (4o, 4u) of the textile structure (4) and, where appropriate, the other fibres of the non-woven fabric (2) are joined to one
20 another at their points of intersection.
18. Resin-impregnated mat according to one of Claims 13 to 17, characterised in that the fibres (4o, 4u) in the textile structure (4) of the non-woven-fabric reinforcement (2) are laid onto one another at an angle
25 of intersection (30) that corresponds to conventional textile structures.
19. Resin-impregnated mat according to one of Claims 13 to 18, characterised in that in the case of a thrust loading of the component the fibres of the textile
30 structure are laid at an angle of intersection of 45 degrees.
20. Resin-impregnated mat according to one of Claims 13 to 19, characterised in that the resin-impregnated mat

is built up from several layers of a non-woven-fabric reinforcement which each exhibit a textile structure.

21. Resin-impregnated mat according to Claim 20,
characterised in that in the individual layers the
5 angles of intersection of the fibres of the textile
structures are different.
22. Resin-impregnated mat according to one of Claims 13
to 21, characterised in that the resin-impregnated
mat (26) additionally contains at least one layer of
10 random fibres (16).
23. Resin-impregnated mat according to one of Claims 13
to 22, characterised in that the fibres (4o, 4u, 5, 6,
16) consist of glass, carbon, aramide or HD
polyethylene.
- 15 24. A process for producing components from resin-
impregnated mats produced by a process as described in
Claims 1 to 12, characterised in that a matured resin-
impregnated mat that has been prepared for extrusion is
drawn off in the form of a web from its roll, in that
20 the backing film and the covering film are peeled off
from the web, in that a blank having the crude contour
of the component to be generated is cut out of the web,
in that this blank of the resin-impregnated mat is
placed into a press, in that further blanks are
25 generated, in that so many blanks are placed into the
press until the requisite wall thickness of the
component to be generated has been attained, and in
that the extrusion operation is then carried out in
known manner.
- 30 25. A process for producing components from resin-
impregnated mats produced by a process as described in
Claims 1 to 12, characterised in that matured resin-
impregnated mats that have been prepared for extrusion
are drawn off in the form of webs from rolls, in that

the backing films and covering films are peeled off from the webs, in that the webs are superimposed in several, at least two, layers, in that a blank having the crude contour of the component to be generated is cut out of the webs, in that this blank consisting of at least two layers of resin-impregnated mats is placed into a press, in that so many blanks are placed into the press until the requisite wall thickness of the component to be generated has been attained, and in that the extrusion operation is then carried out in known manner.

26. Process according to Claim 24 or 25, characterised in that the cutting of the blanks out of the webs by means of a computer-controlled cutting device is undertaken automatically after presetting of the dimensions of the blank or of the contour of the blank.

27. Process according to one of Claims 24 to 26, characterised in that the blanks are picked up by means of a computer-controlled handling device and are placed into the press.

28. Process according to one of Claims 24 to 27, characterised in that the data relating to the composition of the resin-impregnated mats, the production date of the resin-impregnated mats, the characteristic data of the cutting device, the component number, the position of the blank in the component, the characteristic data of the press and, where appropriate, of the handling device and also the production date of the component are stored, assigned to the component, where appropriate encoded in a code and where appropriate attached to it, and in that in the event of a production fault or in the event of damage the cause is sought on the basis of these data.

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ANNEXES TO THE IPER

New Claims

1. A process for producing resin-impregnated mats from fibre-reinforced plastics, sheet-moulding compounds (SMCs), for use as semi-finished products in the production of components by the extrusion process, characterised in that the non-woven-fabric reinforcement of the resin-impregnated mats is formed from at least one layer of intersecting endless fibres which resembles a textile structure, the alignment of these fibres, the fibre orientation, being matched to the loading by the forces acting on the component, and in that the non-woven-fabric reinforcement is drawn off in one piece from a roll and after impregnation with the resin is cut to size in accordance with the given contour.
13. A resin-impregnated mat produced by the process according to one of Claims 1 to 12, characterised in that the non-woven-fabric reinforcement (2) of the resin-impregnated mat (26) comprises at least one layer (4) of intersecting endless fibres (4o, 4u) which resembles a textile structure, the alignment of these fibres (4o, 4u), the fibre orientation, being matched to the loading by the forces acting on the component.
24. A process for producing components from resin-impregnated mats produced by a process as described in Claims 1 to 12, characterised in that a matured resin-impregnated mat that has been prepared for extrusion, produced with a non-woven-fabric reinforcement consisting of at least one layer of intersecting endless fibres, is drawn off in the form of a web from its roll, in that the backing film and the covering film are peeled off from the web, in that a blank having the crude contour of the component to be generated is cut out of the web, in that this blank of the resin-impregnated mat is placed into a press, in

that further blanks are generated, in that so many blanks are placed into the press until the requisite wall thickness of the component to be generated has been attained, and in that the extrusion operation is
5 then carried out in known manner.

25. A process for producing components from resin-impregnated mats produced by a process as described in Claims 1 to 12, characterised in that matured resin-impregnated mats that have been prepared for extrusion,
10 produced with a non-woven-fabric reinforcement consisting of at least one layer of intersecting endless fibres, are drawn off in the form of webs from rolls, in that the backing films and covering films are peeled off from the webs, in that the webs are
15 superimposed in several, at least two, layers, in that a blank having the crude contour of the component to be generated is cut out of the webs, in that this blank consisting of at least two layers of resin-impregnated mats is placed into a press, in that so many blanks are
20 placed into the press until the requisite wall thickness of the component to be generated has been attained, and in that the extrusion operation is then carried out in known manner.